

The Structural Biology Center at the Advanced Photon Source

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The Structural Biology Center (SBC) is a collaborative access team funded by the U.S. Department of Energy that operates a national user facility for macromolecular crystallographic research at the Advanced Photon Source at Argonne National Laboratory. The SBC operates an insertion-device beamline (19-ID) and a bending-magnet beamline (19-BM). Each beamline is equipped with a fully tunable monochromator, collimator slits, high-precision sample and detector positioning systems, and high-resolution x-ray optics designed to deliver a stable, intense, highly focused x-ray beam with low angular divergence onto crystal samples. The intensity of x-rays on the crystal is monitored with a beam-intensity monitor. The monochromator is designed to reach most absorption edge energies used in macromolecular crystallography. For multiwavelength anomalous diffraction (MAD) experiments, the absorption spectra are monitored with a fluorescence detector. Crystals are mounted on a miniaturized Kappa goniostat, aligned using dual video cameras, and maintained at 100 K with a liquid nitrogen cryosystem. Diffraction images are collected at high speed with a 3 x 3 mosaic (3072 x 3072 pixels) CCD area detector that has been optimized for short exposures. Data are collected and processed efficiently with either HKL2000 or d*TREK, which take advantage of the high-throughput computing environment.